

Abstract

A hydraulically driven pump includes a first chamber exposed to a process fluid, a second chamber configured to retain a hydraulic fluid, and a multi-layer diaphragm positioned between the first and second chambers. The diaphragm includes a

5 first layer in contact with the process fluid being pumped, a second layer in contact with the hydraulic fluid, and a third layer that includes an elastomeric base material and an elastomeric conductive trace embedded in the elastomeric base material. The third layer is positioned between the first and second layers and being movable relative to the first and second layers. Changes in an electrical resistance of the conductive trace indicate a

10 failure condition in one of the first, second and third layers.